Himalayan collision, subduction and subsequent ultrahigh-pressure metamorphism

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Himalayan Mountain Range (including the Tibetan plateau), represents a classic example of continent-continent collision where Indian plate collided with Eurasian plate, sandwiching an intra-oceanic island arc (the Kohistan-Ladakh arc) and forms one of the world's largest orogenic systems. This gigantic orogenic system is a natural laboratory of geological processes such as crustal deformation, regional metamorphism, mountain building, and climatic systems. In addition, in the western part of Himalayas a complete sequence of oceanic plate stratigraphy (an ophiolitic sequence) can be observed. The Indian plate after its break-up from Gondwana in Paleozoic drifted northward (>5000 km), collided with Asian plate and part of the Indain plate slab subducted to mantle depths experiencing high- to ultrahigh-pressure metamorphism before its final exhumation to the Earth's surface.

In this talk, I will discuss (1) the tectonic setting of the Himalayan region, (2) subduction and collision-related metamorphism: seen in the field and in lab, and (3) geochemical and geochronological results from the main lithological units, particularly UHP eclogites. For further understanding following articles are recommended.

Rehman, et al., 2007. Thermobaric Structure of the Himalayan Metamorphic Belt in Kaghan Valley, Pakistan. *Journal of Asian Earth Sciences* **29**, 390-406.

Rehman et al., 2011. Timing of collision of Kohistan-Ladakh arc with India and Asia: Debate. *Island Arc* **20**, 308–28.

Rehman et al., 2014. Oxygen isotopes in Indian Plate eclogites (Kaghan Valley, Pakistan): Negative δ18O values from a high latitude protolith reset by Himalayan metamorphism. *Lithos* **208-209**, 471–483.

Rehman et al., 2016. Source and mode of the Permian Panjal Trap magmatism: Evidence from zircon U-Pb and Hf isotopes and trace element data from the Himalayan ultrahigh-pressure rocks. *Lithos* **260**, 286–299.